STARODUBTSEV, S.V.; KHRUSHCHEV, B.I.

Elastic scattering of α-particles on silver and deuterons on gold. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.5:85-86 '62. (MIRA 15:11)

1. Institut yadernoy fiziki AN UzSSR.
(Alpha rays—Scattering)
(Deuterons—Scattering)

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; ZIYATDINOV, Sh.; KEYTLIN, L.G.

Molecular transformations in a natural gas produced by electrodeless high-frequency discharges. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.6:53-60 '62. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut institut AN UzSSR.
(Electric discharges through gases)
(Cracking process)

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; ALIMOVA, L.Ya.; SOKOLOVA, Yu.B.

Molecular transformations in a natural gas produced by electrodeless high-frequency discharges. Part 4. Kinetics of the formation and destruction of certain free radicals. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 6 no.6:61-65 '62. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN UzSSR.
(Radicals (Chemistry))
(Electric discharges through gases)

s/

BOOK EXPLOITATION

AM4027871

Starodubtsev, S. V.; Niyazova, O. R.; Kiv, A. YE.

Radiation effects in cadmium sulfide (Radiatsionny*ye effekty* v sul'fide kadmiya) Tashkent, Izd-vo AN UzSSR, 63. 0132 p. illus., biblio. 1,500 copies printed. (At head of title: Akademiya nauk Uzbekskoy SSR. Institut yadernoy fiziki) Added t.p. in Uzbek.

TOPIC TAGS: cadmium sulfide, semiconductor, radiation defects in semiconductors, semiconductor particle counters, electromagnetic radiation charged particle effect, neutron bombardment, induced conductivity, cadmium sulfide radiation effect

PURPOSE AND COVERAGE: The book contains a review of Soviet and other literature devoted to the study of physical properties of cadmium sulfide and radiation effects observed when various types of radiation act on the cadmium sulfide. The monograph contains the physi-

Card 1/3

AM4027871

cal characteristics of cadmium sulfide, the current ideas concerning the changes in its properties following irradiation, and the results of the authors' research on the x-ray conductivity of this semiconductor under local irradiation. The book is intended for scientists who investigate properties of semiconductors, semiconductor counters, the character and role of radiation defects in semiconductor materials.

TABLE OF CONTENTS [abridged]:

Card 2/3

AM4027871

magnetic radiation and cadmium sulfide - - 77
Ch. V. Radiation effects in cadmium sulfide irradiated by charged particles and neutrons - - 99
Ch. VI. Probe characteristics of induced conductivity of cadmium sulfide - - 114

SUB CODE: PH SUBMITTED: 27Mar63 NR REF SOV: 067

OTHER: 190 DATE ACQ: 07Oct63

Card 3/3

ACCESSION NR: AT3007248 S/2952/63/000/000/0011/0018

AUTHORS: Starodubtsev, E.S. V.; Ablyayev, Sh. A.; Yermatov, S.Ye.; Pulatov, U.U.

TITLE: Changes in adsorptivities of silicagels and zeolites under the action of high-frequency discharges

SOURCE: Radiatsion. effekty* v tverd. telakh. Tashkent, Izd-vo AN UzbSSR, 1963, 11-18

TOPIC TAGS: adsorption, adsorptivity, silicagel, zeolite, electric discharge, slow electron, gamma ray, cosmic radiation, temperature effect, isotherm, high-frequency discharge

ABSTRACT: The paper reports the basic results of an experimental investigation of the effect of fluxes of slow electrons on the adsorption properties of synthetic zeolites and silicagels. Test objects were: Silicagel Mark KSK and synthetic zeolites of the types 4Å (NaA) Gor'kovskoye, CaA 5Å Gor'kovskoye, 13x(Nax) Gor'kovskoye, 4Å (NaA) Groznoye, and CaA 5Å Groznoye. High-frequency electric discharges served as slow-electron sources. The changes in the adsorptional properties were investigated experimentally by the adsorption of gases by adsorbents measured by manometric tubes. The specimen adsorbent, contained in a glass ampoule (A), is

Card 1/3

ACCESSION NR: AT3007248

first heated to 350-400°C under continuous evacuation. The A is then filled with the test gas from a reservoir V, following the evacuation of the air from the entire system down to 10^{-3} to 10^{-4} mm Hg. The gas is permitted to enter the adsorbent container A up to a specified pressure, whereupon A is soldered tight and thus cut off from the vacuum equipment and held at room temperature until the establishment of an equilibrium pressure, which is of the order of 10^{-1} mm Hg. The instrument is then exposed to the action of the high-frequency discharges. Zeolites: Test results, plotted in the form of curves, show that all types of zeolites gain in adsorptional capacity under the effect of slow electrons. These changes increase with increasing irradiation time up to a specified limit and then achieve saturation after about 6 to 10 min. Optimal results were obtained with the Gor'kovskoye zeolites of the types 13x(Nax) and CaA 5Å. Isotherms of ordinary and induced adsorption of zeolites with reference to dry air at temperatures of 20 and −196°C were derived. Silicagels: Exposure to the discharges increased the adsorptivity of silicagel substantially. Saturation at any given oscillatory power was achieved after 8-15 minutes. Isotherms of ordinary and induced adsorption of silicagel with respect to dry air in the 10^{-1} to 10^{-3}-mm-Hg range were obtained at temperatures of 0, +30, +60, and −196°C. Adsorbent temperature exerted a noticeable effect on the magnitude of both ordinary and induced adsorption. The adsorptivity of silicagel and zeolites increases with decreasing temperatures even without irradiation.

Card 2/3

ACCESSION NR: AT3007248

However, the changes are substantially greater under irradiation, and the adsorption is much more permanent. The effect of lower temperatures is stronger on zeolites than on silicagels. Some light is shed on the effect of slow electrons and gamma-ray radiational effects on the surface layer and into the depth of an adsorbent. Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 14Oct63 ENCL: 00

SUB CODE: PH, EE, MA NO REF SOV: 006 OTHER: 000

Card 3/3

ACCESSION NR: AT3007249 S/2952/63/000/000/0019/0021

AUTHORS: Starodubtsev, S. V.; Ablyayev, Sh. A.; Yermatov, S. Ye; Azizov, S. A.

TITLE: Effect of gamma radiation on the adsorptional properties of synthetic zeolites

SOURCE: Radiatsion. effekty* v tverd. telakh. Tashkent, Izd-vo AN UabSSR, 1963, 19-21

TOPIC TAGS: adsorption, ordinary adsorption, supplementary adsorption, radiation-induced adsorption, zeolite, gamma ray, gamma-ray-induced adsorption, radiation, gamma radiation, temperature effect, isotherm

ABSTRACT: The paper describes an experimental investigation of the effect of gamma rays on the adsorptivity of synthetic zeolites. The tests were performed by the ordinary volumetric method on 3 Gor'kovskoye specimens of the types 4Å (NaA), CaA 5Å, and 13x (Nax), and two Groznoye specimens 4Å (NaA) and CaA 5Å. The zeolite specimens were first heat-treated thoroughly at temperatures of 350-400°C at pressures between 10^{-1} and 10^{-6} mm Hg for several hours. The zeolites were then exposed to gamma rays of a radiation dosage rate of 150 to 350,000 r/hr, with a total dose of 2 to $3 \cdot 10^6$ r. The adsorptivity of the zeolites was found to be

Card 1/3

ACCESSION NR: AT3007249

significantly increased; the increase grew to a certain limit depending on the intensity of the radiation dose. The effect of the glass on the test results was determined by identical control ampoules with O and H, with and without adsorbents, exposed to gamma radiation. It was found that the ampoules not containing adsorbents maintained a constant gas pressure. Therefore, the effect of the glass was found to be nil. It was found that the adsorption temperature affects the magnitude of the gamma-ray effect substantially. The radiational effect decreases at elevated temperatures, that is, a radiational anneal occurs. The effect disappears completely at 300-400°C. It is noted that following an anneal the limiting pressure occurs at lower values of the radiational dose. Comparative isotherms of supplementary and ordinary adsorption of an irradiated zeolite were plotted for dry air at −196° and at room temperature. The nature of the radiation effect observed is explained by the knocking out of a Compton electron by a primary gamma quantum, whereupon the fast electrons pass along a path of 2-3 mm within the zeolite. Having expended their energy on the ionization of the matter, they form a large number of relatively slow electrons with energies of the order of tens of ev. The resulting strong ionization forms negative and positive ions which produce excitations and other defects of various kind. The number of possible defects per gamma quantum ordinarily amounts to several tens of thousands; these defects do not differ from those obtainable by UV and X-ray impingement. The supplementary

Card 2/3

ACCESSION NR: AT3007249

adsorption of gases on the zeolites occurs in such defects. Orig. art. has: 3 figs.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 14Oct63 ENCL: 00

SUB CODE: MA, PA, EE, CH NO REF SOV: 005 OTHER: 000

Card 3/3

ACCESSION NR: AT3007250 S/2952/63/000/000/0032/0037

AUTHORS: Starodubtsev, S.V.; Mikhaelyan, V.M.

TITLE: On the effect of ionizing radiation on the kinetics of isothermal crystallization of vitreous selenium

SOURCE: Radiatsion. effekty* v tverd. telakh. Tashkent, Izd-vo AN UzbSSR, 1963, 32-37

TOPIC TAGS: Se, selenium, vitreous selenium, radiation, ionizing radiation, gamma ray, gamma radiation, crystallization, crystallization nucleus, isothermal crystallization, crystallization germ, germ, amorphous selenium, amorphous Se, vitreous Se, development, development temperature, defect, crystallization center

ABSTRACT: The paper describes some results of an experimental investigation on the effect of a preliminary irradiation by powerful gamma-ray fluxes on the process of formation and growth of crystallization centers in vitreous (amorphous) Se. Vitreous specimens were prepared in the form of cylindrical rods 6-mm diam, 50-60 mm long, by chilling fused Se. The fusion temperature (T) was 300-350°C, the quench T 10-15°. Each specimen was divided into a radiation and a control portion. Co^{60} radiation with 500-650 r/sec and an ambient T of 40° were used.

Card 1/3

ACCESSION NR: AT3007250

Control specimens were held at the same T for the same time. Following irradiation, the specimens were "developed" at T=97°, whereupon germs grew to dimensions that could be readily observed under the ordinary microscope. After "development," the specimens were cooled to room temperature (RT) at which the growth rate of germs is practically zero. Since the specimens had thus become irreversibly "spoiled," each test point required a separate specimen. Therefore, each half of a rod was further subdivided into tablets which were polished and used in the experiment to provide an opportunity for an averaging of the germs observed. The effect of the dosage rate and the total dose on the number of crystallization nuclei is graphically shown in the article. The crystallization nuclei are of the "spherolite"\type. A strong increase in the number of crystallization nuclei with radiation is evident. A separate test was made to prove that this effect is truly radiational and not due to the effect of a radiational increase in temperature of the specimen. A separate experimentation showing the effect of the "development" process on the change in number of germs is also performed. Additional considerations, not yet fully taken into account, are the following: (1) Since the number of defects produced by gamma rays of Co^{60} per unit volume exceeds the number of grains by many orders, it is evident that not every defect (ion, displaced atoms) becomes a crystallization nucleus, and that a germ apparently is a larger formation than a singular defect. (2) The strongly nonlinear variation of the number of

Card 2/3

ACCESSION NR: AT3007250

grains with radiational dose and dosage rate shows that a preliminary coagulation of defects is necessary for the formation of a germ. (3) The possibility that the radiation produces an activation of "undeveloped" impurities, is not to be excluded. However, the independence of the increase in number of germs from the dose in various specimens contradicts this hypothesis. Orig. art. has: 6 figures.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 14Oct63 ENCL: 00

SUB CODE: MA, CH, PH, EE NO REF SOV: 002 OTHER: 002

Card 3/3

STARODUBTSEV, S.V.

S/166/63/000/001/004/010
B104/B186

AUTHORS: Starodubtsev, S. V., Generalova, V. V., Polyak, G. V.

TITLE: The influence of the irradiation conditions on the radiolysis of carbohydrate solutions

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1963, 39 - 45

TEXT: Glucose, maltose and saccharose solutions have been irradiated in closed and open ampuls of molybdenum glass by Co^{60} with an activity of $120 \cdot 10^{13}$ g·equ. Ra, the dose rates being varied between 27 and 600 r/sec at temperatures between 0 and 80°C. The aim was to study the influence of the dose rate, the temperature and occluded gases on the properties of this solutions. Results: The rotation of the polarization plane increases with the dose rate. The variation of the specific rotationsis the greater the smaller concentration. The polarization plane rotation of a solution depends only slightly on the dose rate, on the irradiation temperature, on the outer pressure and on the existence of occluded gases. The absorption maxima are in the near UV (264 - 270 mμ) and depend linearly on the dose

Card 1/2

rate in wide range. Dose rate, pressure, presence of oxygen show almost no effect on the absorption maximum. The dioxyacetone yield increases considerably with the irradiation temperature. The upper limit of determination of the absorbed dose depends highly on the concentration of the solutions. At a glucose concentration of 9 % the upper limit is $300 \cdot 10^9$ r, 18 % - $450 \cdot 10^6$ r, 45 % - $800 \cdot 10^6$ r. Similarly, at high dose rates, a new acidic polymer with a molecular weight of 1200 - 4000 and an empirical formula $(C_6H_{10}O_{6.8})_n$ was discovered by S. A. Barker et al., Rad. Res., 16, N3, 1962. There are 6 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AS UzSSR)

SUBMITTED: October 9, 1962

S/166/63/000/001/005/010
B104/B166

AUTHORS: Starodubtsev, S. V., Generalova, V. V.

TITLE: The use of some carbohydrates for dosimetry of neutrons mixed with γ-fields.

PERIODICAL: Akademiya nauk Uzbekskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1963, 46 - 50

TEXT: The first section is a study of dose measuring in mixed radiation fields according to the variation of the polarization plane rotation in irradiated solutions of glucose, maltose and saccharose. It is found that, with a decrease of the neutron flux in the order of one magnitude within the range of a neutron flux of $2 \cdot 10^{13}$ neutrons/cm^2, the decrease of the specific rotation angle does not exceed 10 % at one integral dose. The second section deals with dose measuring according to an investigation of the absorption spectra of the irradiated solutions. The absorption spectrum of an 18 % glucose solution shows a monotonic increase of absorption density dependent on the radiation dose between 230 and 290 mμ. It is shown that his method can be expanded for measuring small doses. In the

Card 1/2

The use of some carbohydrates for ...

third section the influence of the reactor radiation on the viscosity of glucose solutions is studied. There is a lower limit of the radiation dose above of which the viscosity increases considerably. The lower the concentration the lower the limit. If the solution is irradiated further a solid phase is precipitated. The method is of interest for studying the physico-chemical processes arising in the solution during irradiation but not of any value for quantitative measurements. There are 7 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AS UzSSR)

SUBMITTED: October 9, 1962

ACCESSION NR: AP3000218 S/0166/63/000/002/0041/0043

AUTHORS: Starodubtsev, S. V.; Kiv, A. Ye.

TITLE: On the problem of radiation-generated destruction in crystals

SOURCE: AN UzSSR. Izv. Seriya fiziko-matem. nauk, no. 2, 1963, 41-43

TOPIC TAGS: radiation destruction, electron bombardment, ionization cross section, pair distribution, valence crystals

ABSTRACT: A process of radiation destruction in germanium crystals, generated by 100-kev electron bombardments, has been studied. The K-shell ionization cross section σ_K is given, and the assumption is made that the crystal thickness is much smaller than the electron mean free path. An expression is derived for the concentration of probable pair distribution of ionized atoms n'_p (multiplied by 1 - γ_K, η_K - output fluorescence), and eventually of the atom concentration displaced by a single electron, or

$$n_s = n'_p W = \frac{1}{2} \cdot \frac{\tau}{T} N_0^2 \sigma_K^2 a (1 - \eta_K).$$

It is shown that in valence crystals, with sufficiently slow hole mobility, the

Card 1/2

ACCESSION NR: AP3000218

mechanism generating displacement is even more effective when associated with valence electron transfer and outer shell ionization. Orig. art. has: 8 formulas.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AN UzSSR)

SUBMITTED: 20Jan63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 003

Card 2/2

ACCESSION NO: AP3000219 S/0166/63/000/002/0044/0048

AUTHORS: Starodubtsev. S. V.; Begzhanov, R. B.; Rakovitskiy, S. L.

TITLE: Investigations of Hg^{198} conversion electrons on beta-spectrometer with $\pi/\sqrt{2}$ focusing

SOURCE: AN UzSSR. Izv. Seriya fiziko-matem, nauk, no. 2, 1963, 44-48

TOPIC TAGS: beta spectrometer, resolving power, transverse magnetic field, excitation level, conversion line, gamma radiation

ABSTRACT: The details of a beta-spectrometer BPP-3M with a double focusing system at $\pi/\sqrt{2}$ focusing angles has been discussed. The authors claim it has a high resolving power with a transverse magnetic field range of 11.4 to 624 oersteds, capable of focusing electrons with 5.6 kev to 3.7 mev energies. The beta-spectrometer is used to study the β-decay of Au^{198} to the first excitation level of Hg^{198}, which in turn decays to the ground state by emitting γ-radiation with 411.8 kev energy. The spectrometer is shown to record with good resolution the conversion lines L_1, M, and N-shells of Hg^{198} generated by the gamma radiation. Comparing theoretical and experimental values, the transition energy of 411.8 kev in Hg^{198} is found to have

Card 1/2

ACCESSION NO: AP3000219

an electric quadrupole nature. Orig. art. has: 3 tables and 3 figures.

ASSOCIATION: Institut yadernoy fiziki, AN UzSSR (Institute of Nuclear Physics AN UzSSR)

SUBMITTED: 06Feb63 DATE ACQ: 12Jun63 ENCL: 00

SUB CODE: PH NO REF SOV: 005 OTHER: 012

Card 2/2

L 17316-63 EPR/EPF(c)/EPF(n)-2/EWT(m)/BDS AFFTC/ASD/ESD-3/SSD Ps-4/
Pr-4/Pu-4 WW

ACCESSION NR: AP3005532 S/0166/63/000/003/0023/0028

AUTHORS: Begzhanov, R. B.; Glady*shev, D. A.; Starodubtsev, S. V.; Khaydarov, T.

TITLE: Investigation of slow neutron spectra 19 77

SOURCE: AN ArmSSR. Izv. Ser. tekhn. nauk, no. 3, 1963, 23-28

TOPIC TAGS: slow neutron, chopper, reactor, pulsed neutron source

ABSTRACT: Experiments were conducted to determine the neutron energy spectrum of slow neutrons emerging from a horizontal channel of a water-moderated reactor. To determine neutron cross sections in the 10-KeV energy range a mechanical neutron velocity selector of 8.5 μ sec/m resolution was used with a pulsed neutron source of 1200 pulses per minute. The slow neutron energy spectrum obtained at various reactor loads and various channel widths (64 and 32 μ sec), gave a Maxwellian distribution in the wave length region 0.75 to 1.5 Å. The effective neutron temperature was estimated at 375K with a moderator temperature of 308K. Orig. art. has: 4 formulas and 2 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics Academy of Sciences, Uzbek SSR)

Card 1/2

ACCESSION NR: AP3005534 S/0166/63/000/003/0041/0043

AUTHORS: Kiv, A. Ye.; Starodubtsev, S. V.

TITLE: Some models of radiation damage in nonconducting crystals

SOURCE: AN ArmSSR. Izv. Ser. tekhn. nauk, no. 3, 1963, 41-43

TOPIC TAGS: radiation damage, nonconducting crystal, dielectric crystal, dielectric, multiple ionization, K shell, Auger transition, lifetime, rest time, Coulomb collision, valence crystal

ABSTRACT: This is a continuation of the authors' previous work (Izvestiya AN UzSSR, ser. f-m., 2, 1963) on the mechanism of displacing atoms in valence crystals by ionization of the inner shells in two series of arranged atoms. The appearance of a supplementary charge near the arranged atoms leads to an increase in potential energy. The potential curve for the subsystem consisting of the indicated atoms is raised relative to the initial curve as a result of supplementary Coulomb collisions. The authors consider two characteristic times of holes in the effect of ionization: lifetime and rest time (this latter determined by the degree of overlap of the wave functions of electrons in neighboring atoms or by the width of

Card 1/2

ACCESSION NR: AP3005534

the corresponding energy zone in the crystal). Displacement is a matter of ionization, and multiple ionization of an individual atom is possible during: 1) the photoelectric effect in the K shell, with subsequent Auger transitions; 2) the Compton effect on the K shell, with subsequent Auger transitions; 3) the ionization of the K shell by high-speed charged particles, with subsequent Auger transitions; and 4) direct multiple ionization of the valence shell by high-speed charged particles. Orig. art. has: 1 figure and 7 formulas.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AN UzSSR)

SUBMITTED: 12Mar63 DATE ACQ: 20Aug63 ENCL: 00

SUB CODE: PH NO REF SOV: 004 OTHER: 001

Card 2/2

ACCESSION NR: AP4002542 S/0166/63/000/005/0040/0044

AUTHORS: Starodubtsev, S. V.; Begzhanov, R. B.; Rakovitskiy, S. L.

TITLE: Multipolarity of gamma transitions in Sn^{116} accompanying beta decay of 54 min. In^{116m}

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matem. nauk, no. 5, 1963, 40-44

TOPIC TAGS: tin 116, indium 116m, gamma transition, beta decay gamma emission

ABSTRACT: The internal conversion of high energy γ - transitions in Sn^{116} accompanying beta decay of 54 min In^{116m} have been studied, correcting and extending previous investigations. Measurements were made on the β - spectrometer with double focusing at $\pi\sqrt{2}$ angle with a resolution, determined by K-line γ-radiation at 411.8 kev Hg^{198}, equal to 0.2%. The source used was indium oxide on aluminum foil, 1/mg /cm^2 in thickness applied to low intensity γ-transitions in the hard band. The results allow one to determine the angular momentum and the parity of high excitation levels in Sn^{116}, obtained from the β-decay 54 min In^{116m}. For the 2807 kev level the most probable magnitude was I = 4 and π = + which confirms the measurements of γ-transition angular correlations of 1510 Mev and 1296 Mev. Orig. art. has: 3 figures, 2 tables, and 1 formula.

ASSOCIATION: INSTITURE OF NUCLEAR PHYSICS AN UZSSR

Card 1/2

ACCESSION NR: AP4013024 S/0166/63/000/006/0046/0050

AUTHORS: Starodubtsev, S. V.; Vakhidov, Sh. A.

TITLE: EPR spectra of gamma-irradiated germanium-doped quartz crystals

SOURCE: AN UzSSR. Seriya fiziko-matematicheskikh nauk, no. 6, 1963, 46-50

TOPIC TAGS: EPR spectrum, electron paramagnetic resonance, gamma ray, quartz crystal, germanium doped quartz crystal, germanium impurity, radiation defect, hyperfine structure, negative rhombohedron, positive rhombohedron, cobalt 60, paramagnetic center

ABSTRACT: The paramagnetic resonance method has been proved very successful in recent years for studying several defects and for discerning the connection between these defects and both impurities and crystalline peculiarities in quartz. The method employed by the present authors is that discussed by I. H. Anderson and I. A. Well (The Journal of Chemical Physics, v. 31, 1959, no. 2). It was found that after Ge-doped quartz crystals are exposed to gamma radiation specific peaks of electron paramagnetic resonance are formed. The samples were cut in plates (10 x 4 x 1 mm) from negative and positive rhombohedrons. After sectioning and polishing, the samples were exposed to gamma radiation from Co^{60} for 15 min, at a radiation

Card 1/2

ACCESSION NR: AP4013024

intensity of 590 roentgens/sec and either a temperature of 35C or in liquid nitrogen. Three peaks were observed. The second disappeared after 24-hour exposure of the plates to gamma rays or if the sample was held at 100C for 10 minutes. The authors suggest that the paramagnetic centers are unpaired electrons, localized at impurities of Ge surrounded by four atoms of oxygen and one compensating charge of an electron by a Na^+ or Li^+ ion. The hyperfine structure of the line appears because of interaction with spins of I=3/2 of Na^{23} or Li^7 nuclei. The authors conclude that the shape of the electron paramagnetic resonance lines is determined by Ge impurities. Since the second peak is observed in all pyramids of crystal growth, it is probably due to a defective state in which Ge occurs in interstitial sites. The specific spectra of elsctron paramagnetic resonance and the nature of luminescense of the different faces of growth confirm the view that the properties of quartz are sectorially distributed. Orig. art. has: 5 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics AN UzSSR)

SUBMITTED: 09Aug63 DATE ACQ: 03Mar64 ENCL: 00

SUB CODE: PH NO REF SOV: 009 OTHER: 002

Card 2/2

STARODUBTSEV, S. V.; GENERALOVA, V. V.; POLYAK, G. V.

Effect of irradiation conditions on the radiolysis of carbohydrate solutions. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.1: 39-45 '63. (MIRA 16:4)

1. Institut yadernoy fiziki AN UzSSR.

(Carbohydrates) (Radiation—Dosage)

STARODUBTSEV, S. V.; GENERALOVA, V. V.

Use of some carbohydrates for the dosimetry of neutron, mixed, and γ-fields. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.1: 46-50 '63. (MIRA 16:4)

1. Institut yadernoy fiziki AN UzSSR.

(Carbohydrates) (Radiation—Dosage)

STARODUBTSEV, S. V.; KRUSHCHEV, B. I.

Diffusion of slow neutrons through liquid oxygen. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.1:51-55 '63. (MIRA 16:4)

1. Institut yadernoy fiziki AN UzSSR.

(Neutrons) (Liquid oxygen)

STARODUBTSEV, S.V.; KIV, A.Ye.

Mechanisms underlying the formation of radiation defects in crystals. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 7 no.2:41-43 '63. (MIRA 16:6)

1. Institut yadernoy fiziki AN UzSSR.
(Crystals--Defects) (Dielectrics, Effect of radiation on)

STARODUBTSEV, S.V.; BEGZHANOV, R.B.; RAKOVITSKIY, S.L.

Conversion electrons from Hg^{198} in a beta-ray spectrometer with focusing. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 7 no.2: 44-48 '63. (MIRA 16:6)

1. Institut yadernoy fiziki AN UzSSR.
(Internal conversion (Nuclear physics)) (Beta-ray spectrometer)
(Mercury isotopes)

BEGZHANOV, R.B.; GLADYSHEV, D.A.; STARODUBTSEV, S.V.; KHAYDAROV, T.

Energy spectrum of slow neutrons emerging from the horizontal channel of the VVR-S reactor. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 7 no.3:23-28 '63. (MIRA 16:8)

1. Institut yadernoy fiziki AN UzSSR.

KIV, A.Ye.; STARODUBTSEV, S.V.

Structural changes in crystals resultant from multiple ionization of atoms. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.5:37-39 '63. (MIRA 17:8)

1. Institut yadernoy fiziki AN UzSSR.

STARODUBTSEV, S.V.; BEGZHANOV, R.B.; RAKOVITSKII, [illegible]

Multipole order of γ-transitions in Sn^{116} accompanying the β-decay of 54 min. In^{116m}. Izv. AN Uz.SSR. Ser. fiz.-mat. nauk 7 no.5:40-44 '63. (MIRA 17:8)

1. Institut yadernoy fiziki AN UzSSR.

S/109/63/008/002/019/028
D413/D308

AUTHORS: Starodubtsev, S.V., Ablyayev, Sh.A., Yermatov, S.Ye. and Pulatov, U.

TITLE: The effect of radio-frequency discharges on the adsorption properties of silica gel

PERIODICAL: Radiotekhnika i elektronika, v. 8, no. 2, 1963, 328-330

TEXT: The authors have earlier (Dokl. AN SSSR, v. 129, no. 1, 1959, 72; Izv. AN UzSSR, Ser. fiz.-mat. nauk, no. 6, 1960, 93; etc) shown the effect of γ-radiation in enhancing the adsorption of various gases by silica-gel: since this surface effect is known to be due to slow electrons arising from ionization processes, it should also be produced in an RF discharge. Samples of KCK (KSK) industrial silica-gel were exposed after baking to an RF field of intensity 45 - 60 v cm-1 derived from an ЛГЕ -3Б (LGYe-3B) equipment with nominal power output 2 kw and working frequency 25-30 mc/s; the adsorption of air, H_2, CH_4, CO_2 and He after various exposure

Card 1/2

The effect of radio-frequency ...

times was measured by manometer tubes. The resulting curves show increases in adsorption closely similar to those obtained by the action of γ-radiation, ranging from zero for He to a saturation value of 0.4 μ mole g^{-1} for H_2. The induced adsorption disappears completely on baking at 350°C. Isotherms are also given for the induced adsorption of dry air at 0°, 30° and 60°C over the range 10^{-1} - 10^{-3} mm Hg. It is suggested that the effect is due to removal of part of the OH-groups normally covering the surface of the silica-gel. There are 3 figures.

SUBMITTED: March 19, 1962

Card 2/2

STARODUBSTEV, S. V.

AID Nr. 981-1 3 June

MEASURING SECONDARY ION AND ELECTRON EMISSION DURING FILM DEPOSITION ON METALS (USSR)

Arifov, U. A., A. Kh. Ayukhanov, and S. V. Starodubstev. Radiotekhnika i elektronika, v. 8, no. 4, Apr 1963, 669-674. S/109/63/008/004/017/030

A vacuum-tube instrument is described which permits improved observation of high-speed deposition of Na or Mg on a Ta substrate. The device can measure simultaneously the coefficients of secondary emission from the target surface caused by either bombardment by particles of two energy levels or by alternate bombardment of electrons and ions. This electrical circuit differs from the usual double modulation circuit in that the bombarding particles are energized both with a d-c potential, E'_0, and a square-wave generator, whose wave form is in turn modulated by a sinusoidal voltage $E'_a \sin \omega t$. Thus a current of secondary particles, changing periodically per $I = I(E'_0 + E_a \sin \omega t)$,

Card 1/2

MEASURING SECONDARY ION [Cont'd] S/109/63/008/004/017/030

appears at the collector. This current is fed to the vertical deflection amplifier of a cathode-ray oscillograph. The modulation of the primary ion (or electron) current by the modulated rectangular pulses makes it possible to obtain the zero line automatically and to measure secondary currents caused by the maximum-energy ($E'_0 + E'_a$) and minimum-energy ($E'_0 - E_a$) primary particles. The results of bombardment with electrons show that the dependence of the secondary emission of negative particles on film thickness, while differing quantitatively for different bombarding-ion energies, are identical qualitatively and that the coefficients of the secondary emission of negative particles due to both ion and electron bombardment undergo qualitatively similar changes with an increase in film thickness. It is concluded that the method described makes it possible to obtain reliable evaluations for a number of basic secondary emission characteristics. [DW]

STARODUBTSEV, S.V.; VAKHIDOV, Sh.; TSINOBER, L.I.

Sectorial distribution of luminescence centers in synthetic quartz. Kristalografiia 8 no.5:770-773 S-O '63. (MIRA 16:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut p'yezoopticheskogo mineral'nogo syr'ya AN UzSSR.

L 11052-63 EPF(n)-2/EWT(m)/BDS--AFFTC/ASD/AFWL/SSD--Pu-4--DM

ACCESSION NR: AP3001182 S/0089/63/014/005/0490/0491 65

AUTHOR: Begzhanov, R. B.; Gladyshev, D. A.; Starodubtsev, S. V.; Khaydarov, T.

TITLE: Slow neutron spectrum in horizontal channel of VVR-S reactor

SOURCE: Atomnaya energiya, v. 14, no. 5, 1963, 490-491

TOPIC TAGS: slow neutron spectrum, VVR-S reactor, Maxwell distribution

ABSTRACT: The neutron energy distribution in the VVR-S reactor being used by the Institute for nuclear physics of the AN, UzSSR was measured. The mechanical interrupter of 150 mm diameter had 13 plane-parallel slits of 1 mm width. The flight path of neutrons to detector was 7.6 meters, being mostly in a 300 mm diameter vacuum tube. A 35 mm diameter boron counter served as the detector. A multichannel, matrix-type time analyzer was used for recording. The width of the time channel could be varied from 1 to 128 microseconds. The dead time was 10 microseconds. Measurements of the neutron spectrum in a horizontal channel starting from the active zone of the reactor were made at 1200 rpm's and 32 to 64 microsecond channel width. The experimentally found distribution curve is given: energy of neutrons, in relative units, vs. wavelength up to about 4 angstroms. It follows the Maxwellian distribution only around the maximum between 0.75 to 1.5

Card 1/2

STARODUBTSEV, S.V.; ABLYAYEV, Sh.A.; BAKHRAMOV, F.; KEYTLIN, L.G.; YUSOVA, E.N.

Study of the electrocracking of natural gas by the method of vibrational spectra. Zav. lab. 29 no.6:707-708 '63. (MIRA 16:6)

1. Fiziko-tekhnicheskiy institut AN UzbSSR.
(Gas, Natural--Absorption spectra)
(Cracking process)

STARODUBTSEV, S.V.; BEGZHANOV, R.B.; RAKOVITSKIY, S.L.

Nature of highly excited levels in W^{182}. Zhur. eksp. i teor. fiz. 45 no.4:921-926 O '63. (MIRA 16:11)

1. Institut yadernoy fiziki AN Uzbekskoy SSR.

L 12660-63 EWP(q)/EWT(m)/BDS AFFTC/ASD RDW/JD

ACCESSION NR: AP3002882 S/0020/63/150/005/1091/1093

AUTHOR: Starodubtsev, S. V. (Member, AN UzSSR); Pugacheva, T. S.; Mikhaelyan, V. M.; Lenchenko, V. M.

TITLE: Kinetics of formation of crystallization nucleus in vitreous selenium

SOURCE: AN SSSR. Doklady*, v. 150, no. 5, 1963, 1091-1093

TOPIC TAGS: crystallization nucleus, crystallization, selenium, vitreous selenium, ionized radiation, molecular chain rupture

ABSTRACT: An attempt is made to present a possibility for a logical description of the kinetic phenomena in the formation and growth of crystallization nuclei in vitreous selenium. It is a known fact that X-ray and other ionizing irradiations increase the crystallization process of amorphous selenium. It was found in a previous work that preliminary irradiations of vitreous selenium resulted in the increase of crystallization seeds N. Furthermore, a complicated dependence of N on the radiation dose D is observed. These facts are qualitatively explained by several

Card 1/2

L 12660-63
ACCESSION NR: AP3002882

general assumptions: (i) in order for the crystallization to proceed, it is necessary at first to destroy the polymeric molecules which then allow the spatial regrouping of chains. This is ordinarily accomplished thermally since vitreous selenium is thermally unstable. In the present study the ionized radiation method was used to initiate the destruction; (ii) the crystallization process consists of the formation of nuclei in the crystallization phase and its consequent growth. In order for this to take place, a minimum number of polymeric chain ruptures nust occur, forming movable segments in the molecule which regroup and form the stable seed. Further growth takes place by the combination of these separate segments; (iii) The formation of ruptured chains in the irradiated field proceeds by two ways: through the recombination of ions during which the energy is released and which is sufficient for the rupture of the -Se-Se- bond, and through a secondary electronic excitation resulting in the dissociation. In both instances the generation rate is proportional to the intensity of the dose. Orig. art. has: 10 formulas.

ASSOCIATION: Institute of Nuclear Physics, Academy of Sciences, UzSSR

Card 2/3 2

L 14357-63 EWT(l)/EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3 JD/IJP(C)

ACCESSION NR: AP3003849 S/0020/63/151/003/0550/0551

AUTHORS: Starodubtsev, S. V. (Mem. AS, UzSSR); Kiv, A. Ye.

TITLE: Ionization mechanism of formation of structural defects in crystals

SOURCE: AN SSSR. Doklady*, v. 151, no. 3, 1963, 550-551

TOPIC TAGS: radiation damage theory, multiple ionization, valence crystal

ABSTRACT: It has been suggested by F. Seitz (Rev. Mod. Phys. 26, 1954, 1, 17) and J. H. Varley (J. Nucl. Eng. 1, 1954,2, 130) that radiation damage may result from excitation and ionization of elements. This effect is of importance only in nonconducting crystals, as the relaxation time in metals is too short. The authors show on an example of interaction of slow electrons (10^4 to 10^5 ev) with the lattice of a valence crystal that the ionization of the outer electron shells of the atoms may be of greater importance than it is commonly believed. The cross section of multiple ionization is computed as that of K-ionization multiplied by the product of probabilities of Auger-transitions. The potential energy of a multiply-ionized atom is calculated and found to be sufficient to overcome the potential barrier. The recoil energy of the Auger electron may be sufficient to remove the atom into an interstitial position. Orig. art. has: 1 figure.

Association: Inst. of Nuclear Physics, Academy of Sciences UzSSR

Card 1/1

L 17605-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPA(w)-2/EWP(j)/T/EWA(h)/EWA(l)
Pc-4/Pab-10/Pr-4/Peb/Pu-4 ASD(a)-5/BSD/SSD/AFWL/AFETR/RAEM(i)/ESD(gs) RWH/WW/
AM4046721 GG/RM/MLK BOOK EXPLOITATION S/

Ablyayev, Sh. A.; Starodubtsev, S. V.

Radiation effects on the surfaces of gels (Radiatsionny*ye effekty* na poverkhnostyakh geley) Tashkent, Izd-vo Nauka Uzbekskoy SSR, 1964. 123 p. illus., biblio. 1000 copies printed. (At head of title: Akademiya Nauk Uzbekskoy SSR. Fiziko-Tekhnicheskiy Institut) Editor: A. A. Sokolova; Technical editor: Kh. U. Karabayeva; Proofreader: A. I. Arzumanova

TOPIC TAGS: exciton, gamma adsorption, photcadsorption, induced adsorption, desorption, paramagnetic resonance, cathode adsorption, radiation effect, gel surface

PURPOSE AND COVERAGE: This book was intended for scientific personnel working in the field of radiation physics and radiation chemistry and for instructors and students in senior courses in vuzes. The results of experimental research on the radiation effects arising on the surfaces of silica gels and synthetic zeolites during the action of streams of gamma rays or of slow electrons on them are presented. The question of the influence of light on the surface properties of

Card 1/4

semiconductors and dielectrics is analyzed. The work was done in the Laboratoriya Radiatsionnoy Fiziki of the Fiziko-Tekhnicheskiy Institut of the AN UzSSR. The following Laboratory personnel also participated in the experimental work: S. Azizov, Ye. K. Vasil'yeva, T. S. Vinokurova, S. Yermatov, U. U. Pulatov, U. Kh. Rasulev, and V. P. Chirva.

TABLE OF CONTENTS:

L 17605-65
AM4046721

SUB CODE: NP SUBMITTED: 04Feb64 NR REF SOV: 048

OTHER: 031

Card 4/4

L 1582-66 EWT(m) DIAAP

AM5018096 BOOK EXPLOITATION UR/ 35 B+1

Starodubtsev, S. V.; Romanov, A. M. 65

Interaction of gamma radiation and matter. pt. 1: Sources of gamma radiation and elementary processes of the interaction of gamma rays and matter (Vzaimodeystviye gamma-izlucheniya s veshchestvom. ch. 1: Istochniki gamma-izlucheniya i elementarnyye protsessy vzaimodeystviya gamma-luchey s veshchestvom) Tashkent, Izd-vo "Nauka," 1964. 248 p. illus., biblio., tables. (At head of title: Akademiya nauk Uzbekskoy SSR. Institut yadernoy fiziki) 2200 copies printed.

TOPIC TAGS: electromagnetic wave scattering, gamma radiation, gamma ray absorption, gamma ray attenuation, hard electromagnetic radiation, pair theory, pair production

PURPOSE AND COVERAGE: This book is intended for researchers, scientists, and engineers concerned with nuclear and radiation physics. The book deals with processes connected with the penetration of hard electromagnetic radiation through matter and gamma ray transition and secondary radiation. The results of calculations and experimental research are given in a form convenient for practical use. No personalities are mentioned.

Card 1/2

L 1582-66
AM5018096

TABLE OF CONTENTS ;

SUB CODE: NP SUBMITTED: 08Dec64 NO REF SOV: 057

OTHER: 196

Card 2/2

L 11021-65 EWT(m)/EWP(t)/EWP(b) DIAAP/IJP(c)/ASD(a)-5/AFWL/AEDC(b)/SSD/
AS(mp)-2/RAEM(i)/RAEM(c)/ESD(gs)/ESD(t) JD/MLK
ACCESSION NR: AT4046907 S/0000/64/000/000/0017/0022

AUTHOR: Starodubtsev, S.V., Ablyazev, Sh. A., Chirva, V.P. 19 B

TITLE: Investigation of the gamma adsorption effect on silica gel by the electron paramagnetic resonance method

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionny*ye effekty*v kondensirovanny* kh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 17-22

TOPIC TAGS: silica gel, EPR method, radiation defect, saturation effect, electron paramagnetic resonance, silica gel irradiation, Gamma radiation, Gamma adsorption effect, gas adsorption

ABSTRACT: The gas adsorption capacity of silica gel 21 is enhanced considerably after exposure to δ-radiation. In the present paper, this socalled γ-adsorption effect is studied as a function of the γ-radiation dose, atmospheric pressure and temperature. An explanation of the observed effects is presented. The electron paramagnetic resonance method was applied to KSM-6 silica gel with the following parameters: SiO_2 98.1% Al_2O_3+ Fe_2O_3 1.9%; CaO traces, 0-0.53%, specific surface area according to the low temperature

Card 1/4

adsorption of nitrogen vapor-700 m^2/g, maximum pore diameter -19Å. Chemical treatment of the silica gel was avoided; however, it was heat treated at 350C for 8 hours before irradiation. EPR spectra were taken for two values of atmospheric pressure (10^{-2} and 10^{-5} mm Hg) and for different temperatures and doses of irradiation. The concentration of paramagnetic centers for a given radiation dose and temperature could be obtained by graphic integration of the EPR curves. However if the EPR lines are similar and their amplitude proportional to the concentration, one can obtain the dependence of the concentration of the centers on radiation dose from the amplitudes of the first derivatives of the adsorption line. The latter method is employed in this paper and the dependence of the concentration of paramagnetic defects on radiation dose is given in Fig. 1 of the Enclosure. The saturation effect is evident, starting at about 7-8 Mr for 10^{-2} mm Hg and 15-17 Mr for 10^{-5} mm Hg. The saturation effect is explained by the equilibrium between newly formed centers created by the γ-rays and the recombination of defects and their radiation annealing. An increase in temperature causes a slow decrease in the magnitude of the amplitude peaks at 10^{-2} mm Hg, but a similarly regular behavior is not observed at 10^{-5}mm Hg. Here, at the same temperature, the EPR lines become more symmetrical and the amplitudes increase. This is explained by the formation of

L 11021-65
ACCESSION NR: AT4046907

temperature defects occurring simultaneously with the disappearance of the radiation defects. Orig. art. has: 3 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 01 SUB CODE: GP,NP

NO REF SOV: 005 OTHER: 001

Card 3/4

L 11021-65

ACCESSION NR: AT4046907

ENCLOSURE: 01

Fig. 1. Relationship between the number of paramagnetic defects (N) and the dose of irradiation in Mr. 1 - pressure of 10^{-2} mm Hg; 2 - pressure of 10^{-5} mm Hg. abscissa = Dose, Mr

Card 4/4

L 9967-65 EWT(m)/EPF(c)/EPF(n)-2/T Pr-4/Pu-4 AEDC(b)/AFWL/SSD/AS(mp)-2/
Pb-4 GG/MLK

ACCESSION NR: AT4046908 S/0000/64/000/000/0023/0029

AUTHOR: Starodubtsev, S. V.; Ablyayev, Sh.A.; Pulatov, U.U.; Rasulev, U. Kh. B

TITLE: Mass spectrometric investigation of the adsorption and desorption of gas mixtures on the surface of irradiated and non-irradiated synthetic zeolites

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionny*ye effekty* v kondensirovanny*kh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 23-29

TOPIC TAGS: gas adsorption, gas desorption, nitrogen, adsorption, oxygen adsorption, irradiated zeolite, synthetic zeolite

ABSTRACT: The adsorption and desorption processes of a mixture of N_2 and O_2 on the surfaces of irradiated and non-irradiated zeolites were studied by means of a type MKh-1302 mass-spectrometer. The experimental set-up is described. Zeolite samples were subjected to thermovacuum treatment at 350-400C, irradiated with the necessary γ-ray dose, and exposed to the gas mixtures, in which the partial pressure of the components was changed from 20% to 80%. Adsorption was performed at -196C and desorption was observed during a gradual increase in temperature. Kinetic curves of the adsorption of oxygen and nitrogen on irradiated and non-

Card 1/4

L 9967-65
ACCESSION NR: AT4046908

Irradiated zeolite CaA5A at 20C are given in Fig. 1 of the Enclosure. It is clear from this figure that the increase in surface adsorption of oxygen due to irradiation is much larger than for nitrogen. A better representation of the influence of irradiation on the adsorption of oxygen can be obtained by means of the relationship

$$\frac{\Delta P}{P_o} = \frac{P_o - P_t}{P_o}$$

where P_o is the initial partial pressure of a gas and P_t is the partial pressure of the same gas after establishment of an adsorption equilibrium. It was found that the ratio

$$\left(\frac{\Delta P}{P_o}\right)_{O_2} / \left(\frac{\Delta P}{P_o}\right)_{N}$$

changes from a value of 0.7 for non-irradiated zeolite to 1.5-2.5 for irradiated samples. The desorption curves of nitrogen and oxygen for irradiated and non-irradiated samples are also shown. It is concluded that: a) nitrogen molecules are more firmly bound to the zeolite surface; b) nitrogen is adsorbed faster than oxygen on the surface of non-irradiated zeolite; c) irradiation increases the adsorption of oxygen considerably, and d) an intense desorption of CO_2 and CO is observed at temperatures above 350-400C. Orig. art. has: 3 figures and 1 table.

Card 2/4

L 9967-65

ACCESSION NR: AT4046908

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 01 SUB CODE: GP,OP

NO REF SOV: 008 OTHER: 000

Card 3/4

L 9967-65
ACCESSION NR: AT4046908

ENCLOSURE: 01

0

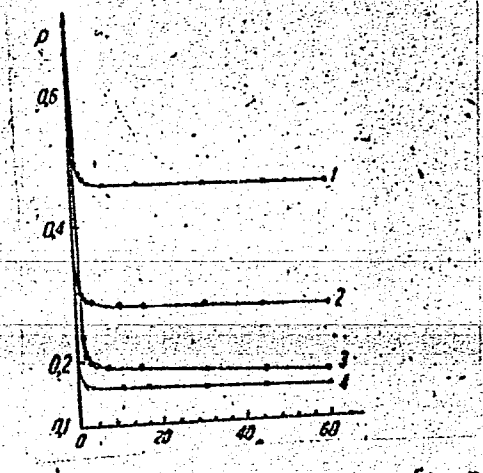


Fig. 1. Kinetic adsorption curves of: nitrogen on irradiated (1) and non-irradiated (4) zeolite; oxygen on irradiated (2) and non-irradiated (3) zeolite.
Ordinate = partial pressure of gas; abscissa = time in minutes

Card 4/4

ACCESSION NR: AP4025901 S/0166/64/000/001/0092/0094

AUTHOR: Starodubtsev, S. V.; Yunusov, M. S.

TITLE: The effect of γ-irradiation on some optical properties of synthetic ruby

SOURCE: AN UzSSR. Izv. Seriya fiziko-matematicheskikh nauk, no. 1, 1964, 92-94

TOPIC TAGS: laser, ruby laser, ruby crystal, gamma irradiation, gamma ray, ruby color center, ruby crystal defect, irradiated ruby

ABSTRACT: In connection with the laser applications of ruby crystals, pink ruby crystals containing 0.2% Cr_2O_3 were studied to determine the formation and stability of color centers as a function of γ-irradiation. The dose rate from a Co^{60} source at 34C was 350 r/sec. The ruby absorption spectrum changes markedly in the visible and ultraviolet regions of the spectrum, beginning with irradiation doses of about 10^3 r. In the red region, this dose causes an increase in density which remains constant regardless of any further rise in irradiation dosage. Marked color saturation was observed at 10^6 r. The thermoluminescence-temperature curve, plotted from room temperature to 500C, has a wide

Card 1/2

L 9966-65 EWT(m)/EWP(e)/EPF(c)/EPF(n)-2/EWP(b) Pq-4/Pr-4/Pu-4 BSD/ESD(c)/AFWL/ASD(a)-5/AS(mp)-2/APGC(b)/ESD(gs) GG/MLK/WH

ACCESSION NR: AT4046905 S/0000/64/000/000/0009/0011

AUTHOR: Starodubtsev, S. V.; Vakhidov, Sh. A.; Kaipov, B.

TITLE: Influence of electrical treatment on the absorption spectrum of crystalline quartz

SOURCE: AN UzSSR. Institut yadernoy fiziki. Radiatsionny*ye effekty* v kondensirovanny*kh sredakh (Radiation effects in condensed media). Tashkent, Izd-vo Nauka UzSSR, 1964, 9-11

TOPIC TAGS: absorption spectrum, quartz, germanium impurity, germanium configuration, quartz crystal, electrical treatment

ABSTRACT: The purpose of this work was to clarify the influence of germanium impurities on the absorption spectrum of quartz. Quartz crystals activated by germanium impurities exhibit a new absorption band with a maximum in the region of 290 mμ when exposed to ionizing radiation. This absorption band originates on the pyramids of a positive <R> and negative <r> of a rhombohedron. The results presented in Fig. 1 of the Enclosure were obtained from a study of the influence of electrical treatment on the absorption spectrum from the <r> and <c> (pinacoid) branches in synthetic quartz. Two kinds of crystal were grown, one activated with germanium impurities and the other non-activated. The samples were in the form of 10 x 4 x 1 mm^3 chips. Electrical treatment was carried out with the aid of graphite and sodium chloride. The source of γ-rays was Co^{60} and samples were irradiated for 15 min. at 260 r/sec. It is clear from the figure that the maximum of 290 mμ disappears after electrical treatment, together with

Card 1/3

L 9966-65
ACCESSION NR: AT4046905

the maxima at 630, 465 and 215 mμ. It is concluded that germanium impurities, as well as alkali metals such as sodium, influence the formation of color centers responsible for the absorption maxima at 290 mμ. Since the introduction of germanium leads to non-uniform physical properties in different growth sections, it is assumed that the impurities enter into the quartz lattice in different configurations; the germanium impurities are in the trivalent state in the pyramids of a positive or negative rhombohedron and in the quadrivalent state in pinacoids. Orig. art. has: 1 figure.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN UzSSR)

SUBMITTED: 01Feb64 ENCL: 01 SUB CODE: OP

NO REF SOV: 004 OTHER: 001

Card 2/3

L 9956-65
ACCESSION NR: AT4046905

ENCLOSURE: 01

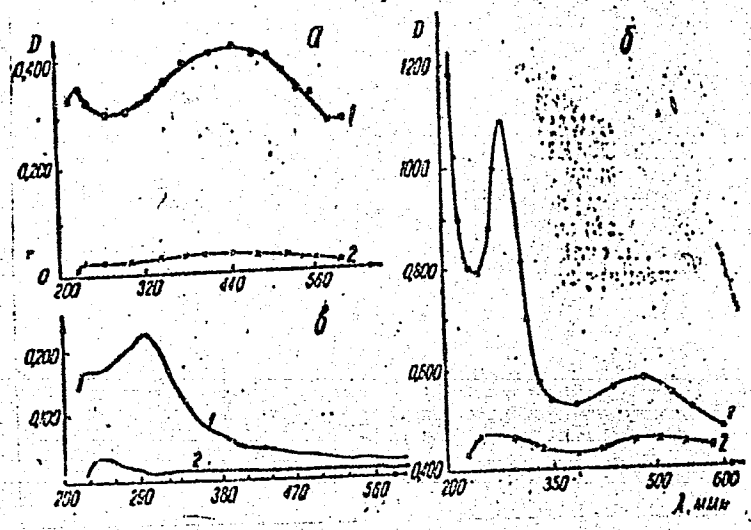


Fig. 1. Absorption spectra of crystalline quartz activated by germanium: a - natural crystal; b - synthetic crystal from a positive rhombohedron; c - crystal from a pinacoid. 1 - before electrical treatment; 2 - after treatment. (Abscissa = wavelength in mμ)

Card 3/3

L 22554-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD/JG

ACCESSION NR: AP5000467 S/0166/64/000/004/0032/0036

AUTHOR: Begzhanov, R. B.; Glady*shev, D. A.; Starodubtsev, S. V.; Khaydarov, T.

TITLE: Measurements of the total neutron cross sections of In and Sm

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1964, 32-36

TOPIC TAGS: neutron cross section, resonant cross section, indium, samarium, neutron spectrometer

ABSTRACT: Measurements of the total cross sections for neutrons interacting with the In and Sm nuclei were carried out on a neutron spectrometer described earlier (Atomnaya energiya, vol. 14, no. 5, 1963). The width of the channel was 8 μ sec. with a 2.23 μ sec/m resolution for In and 2.5 μ sec/m resolution for Sm. The In target was in the form of a 60 mg/cm^2 metallic strip of natural isotopic composition and was investigated over the 0.7-14 ev range. Sm was in the form of a chemical compound with 120 mg/cm^2 of natural samarium. The article contains a detailed description of the mathematical procedures used for the processing of experimental data. The results for In and Sm are contained in Figures 1a and 1b of the Enclosure, respectively. The parameters of the resonances are presented in Table

Card 1/2

L 22554-65
ACCESSION NR: AP5000467

1 of the Enclosure. "Yu. G. Gafurov helped with the measurements." Orig. art. has: 18 formulas, 2 figures and 1 table.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 27Oct63 ENCL: 02 SUB CODE: NP

NO REF SOV: 004 OTHER: 003

Card 2/4

L 21355-65 EPF(c)/EPR/EWG(j)/EWT(m)/EWP(b)/T/EWP(e)/EWP(t)/ Pr-4/Ps-4
IJP(c)/AFWL/SSD WH/WW/JD

ACCESSION NR: AP5000867 S/0166/64/000/005/0037/0040

AUTHOR: Starodubtsev, S.V.; Khrushchev, B.I.; Belyakov, V.A.; Komarov, V.E.

TITLE: Measurement of neutron spectra by a monocrystalline spectrometer in the thermal column

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1964, 37-40

TOPIC TAGS: neutron diffraction, crystal spectrometry, monocrystalline lead, thermal neutron

ABSTRACT: A method suitable for investigating the spectra of thermal neutrons with wavelengths from 1.0 to 5.3A is described. In this method, reflection from the (111) plane of monocrystalline lead is utilized to analyze the neutron beam. The scattering by the crystal is shown schematically in Fig. 1 of the Enclosure. The angle of cut relative to the (111) plane is denoted by α; y is the width of the impingent beam, x that of the reflected beam. The experimental device is shown schematically in Fig. 2 of the Enclosure. The graphite plugs are each 50 cm in length. A fraction of the order of 1% of the basic beam is scattered by the device. Fig. 3 of the Enclosure shows the spectrum obtained by the device. The distribution is approximately maxwellian. Orig. art. has: 5 figures and 4 equations.

Card 1/2

L 21355-65
ACCESSION NR: AP5000857

ASSOCIATION: Institut yadernoy fiziki AN Uz SSR (Nuclear Physics Institute, AN Uz SSR)

SUBMITTED: 26Aug63 ENCL: 03 SUB CODE: NP, OP

NO REF SOV: 000 OTHER: 002

Card 2/5

L 21352-65 EWA(h)/EWT(m)/T Pb-4 AFWL/SSD/AMD/APGC(c)/AFTC(b)/LIP(c)
ACCESSION NR: AP5000862 S/0166/64/000/005/0075/0076

AUTHOR: Starodubtsev, S.V.; Gurskiy, M.N.; Tsoy, A.N. 1 B

TITLE: A liquid scintillator for measuring the dosage of nuclear radiation absorbed in composite reactor fields

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 5, 1964, 75-76

TOPIC TAGS: radiation dosimetry, radiation chemistry, liquid scintillator, terphenyl, chemical dosimetry, gamma radiation, neutron detector 19

ABSTRACT: Ionization chembers and scintillation detectors are used to detect ionizing radiation; however, chemical dosimeters permit the measurement of large doses of radiation. Some of the well-known reactions of radiation chemistry can be used for dosimetry. In the present paper, the authors investigate the possibility of detecting radiochemical changes by means of scintillation radiometry. p-Terphenyl was chosen as best fulfilling the conditions necessary for the detection of mixed gamma-neutron radiation. Determination of the absorbed dosage was accomplished by measuring the light output of the exposed sample in toluene. The scintillation apparatus consisted of a model FEU-29 photoelectric multiplier supplied by a model VS-16 high-voltage stabilizer. The output of the FEU-29 went to a wide-band amplifier model USh-2. p-Terphenyl samples were

Card 1/3

L 21352-65
ACCESSION NR: AP5000862

irradiated with gamma-rays alone and with mixed gamma-neutron radiation. The light output of gamma-irradiated p-terphenyl was found to be constant in the range of absorbed dosage from 6 x 10^6 to 2 x 10^8 rad. In the mixed gamma-neutron radiation of a reactor, there was a linear decrease in the light output in the same interval. (see Fig. 1 of the Enclosure.) The authors determined that about 55% of the total absorbed energy was from fast neutrons. The system described is considered to be suitable for use as a dosimeter for the mixed radiation from a nuclear reactor. Orig. art. has: 2 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Nuclear Physics Institute, AN Uz SSR)

SUBMITTED: 20Jun64 ENCL: 01 SUB CODE: NP

NO REF SOV: 002 OTHER: 002

Card 2/3

L 21352-65

ACCESSION NR: AP5000862

ENCLOSURE: 01

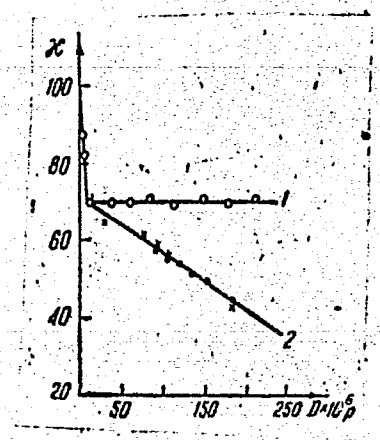


Fig. 1. Variation in the light output of p-terphenyl, irradiated with gamma rays (1), and by the mixed gamma-neutron field of a reactor (2) in toluene as a function of the absorbed dose.

Card 3/3

L 22632-65 EWG(j)/EWA(h)/EWT(m)/EWP(j)/T/EWA(1) Pc-4/Peb IJP(c) RM
ACCESSION NR: AP5003315 S/0166/64/000/006/0083/0084

AUTHOR: Starodubtsev, S. V.; Gurskiy, M. N.; Tsoy, A. N.

TITLE: Dosimetry of large gamma-ray doses on the basis of a liquid scintillator

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 6, 1964, 83-84

TOPIC TAGS: gamma-ray dosimetry, liquid scintillator, benzene, terphenyl

ABSTRACT: The authors investigated the performance of a liquid scintillator consisting of p-terphenyl in benzene, and found that when this scintillator is exposed to gamma rays its light yield decreases in proportion to the absorbed dose. The authors propose on the basis of this result the construction of a dosimeter using 40 cc of distilled benzene in glass ampoules, exposed to gamma rays from Co^{60} with a dose rate of 150 rad/sec, and then used as a solvent for p-terphenyl (5 g/liter). The absorbed dose is determined from the decrease in the light yield, using standard scintillation apparatus. This dosimeter has low sensitivity to changes in the activator concentration over a wide range of concentrations.

Card 1/2

L 22632-65
ACCESSION NR: AP5003315

No change in the light yield was observed in the temperature interval 35--65C when the benzene was exposed to a dose of 3×20^6 rad. No post-effect was likewise observed. It is claimed that this dosimeter is most convenient when measuring doses on the order of 10^5--10^7 rad, with an accuracy of about 10%. Such a dosimeter can be used by any laboratory that makes use of nuclear radiation. Orig. art. has: 2 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 20Jun64 ENCL: 00 SUB CODE: OP, NP

NR REF SOV: 003 OTHER: 004

Card 2/2

STARODUBTSEV, S.V.; LYUTOVICH, A.S.; PRUTKIN, V.P.

Phosphorus diffusion in high-purity polycrystalline silicon. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 8 no.1:77-81 '64. (MIRA 17:6)

1. Fiziko-tekhnicheskiy institut AN UzSSR.

ACCESSION NR: AP4041452 S/0089/64/016/006/0523/0524

AUTHORS: Begzhanov, R. B.; Glady*shev, D. A.; Starodubtsev, S. V.; Khaydarov, T.

TITLE: Cross section for the interaction between neutrons and Sm-149 and In-115 nuclei

SOURCE: Atomnaya energiya, v. 16, no. 6, 1964, 523-524

TOPIC TAGS: neutron interaction, neutron spectroscopy, indium, samarium, resonance scattering

ABSTRACT: The total effective cross sections were measured with the neutron spectroscope previously described (Atomnaya energiya v. 14, no. 5, 1963, Izv. AN UzSSR. Ser. fiz. matem., nauk, no. 3, 1963) at a channel width of 8 μsec and resolution 2.23 and 2.5 μsec/m in the case of indium and samarium, respectively. The resonance parameters were calculated by a method described by G. I. Marchuk

Card 1/

ACCESSION NR: AP4042263 S/0089/64/017/001/0059/0060

AUTHORS: Starodubtsev, S. V.; Khrushchev, B. I.

TITLE: Elastic scattering of alpha particles by boron

SOURCE: Atomnaya energiya, v. 17, no. 1, 1964, 59-60

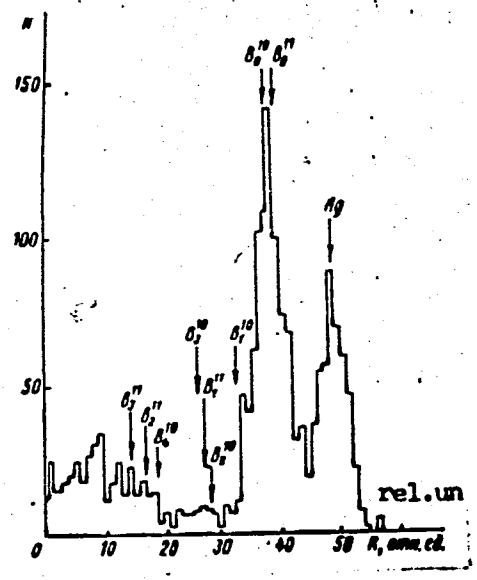
TOPIC TAGS: alpha particle, boron, elastic scattering, charge exchange, alpha cross section, differential cross section, angular distribution

ABSTRACT: Results are presented of measurements of the cross sections for the scattering of alpha particles by natural and enriched (86% B^{10}) boron. The alpha particles in the primary beam had energies 13.6 and 14.7 MeV. The primary-beam energy for natural boron was 13.55 and 14.66 MeV, respectively. The angular distributions were measured in a multiple-plate scattering chamber. The particle beam from the cyclotron was focused on the target by two quadrupole

Card 1/5

ACCESSION NR: AP4042263

ENCLOSURE: 01

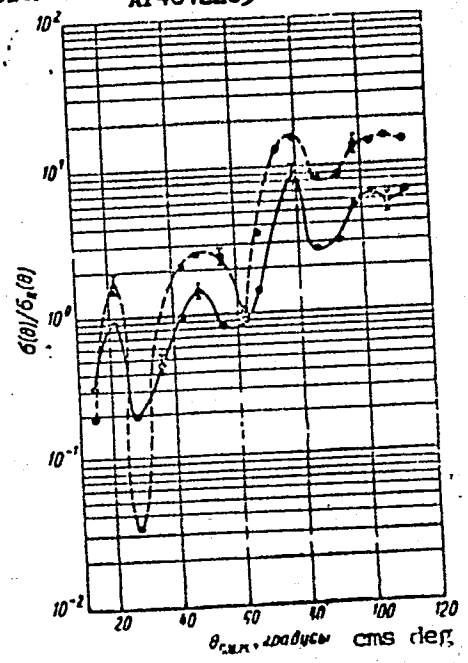


Histogram of ranges of alpha particles scattered by natural boron

Card 3/5

ENCLOSURE: 02

ACCESSION NR: AP4042263



Angular distribution of alpha particles elastically scattered by natural boron with energy 13.55MeV (solid) and 14.66MeV (dashed)

Card 4/5

AP4010295

S/0048/64/C28/001/0076/0079

AUTHOR: Starodubtsev,S.V.; Begzhanov,R.B.; Rakovitskiy,S.L.

TITLE: Concerning the high energy transitions in the decay of 54 min In^{116m} to Sn^{116} /Report, Thirteenth Annual Conference on Nuclear Spectroscopy held in Kiev, 25 Jan to 2 Feb 1963/

SOURCE: AN SSSR. Izvestiya, Seriya fizibheskaya, v.28, no.1, 1964, 76-79

TOPIC TAGS: γ-transition, conversion electron spectrum, indium-116m, indium isomer, multipole order, decay [redacted] scheme.

ABSTRACT: Although the decay of the 54 min isomer of In^{116} has been investigated by several authors the available information on the γ-transitions departing from the high-lying levels in Sn^{116} is still scanty. The characteristics of these γ-transitions are of interest not only per se but also in connection with the theoretical investigations of L.S.Kisslinger (Mat.-fys.medd.danske vid.selskab.,32,9,19-60). In the present work there were measured the internal conversion coefficients of the high-energy γ-transitions in Sn^{116} with a view to obtaining information on these levels and amplifying the results of P.G.Hansen (Nucl.Phys.,30,140,1962) and

Card 1/2

L 17686-65 EWT(1)/EWP(e)/EWT(m)/EPF(c)/EPF(n)-2/EEC(b)-2 Pr-4/Pu-4 IJP(c)/
AS(mp)-2/AFWL/SSD/AFMDC/AFETR/RAEM(i)/RAEM(c)/ESD(gs)/ESD(t) GG/WH
ACCESSION NR: AP4049480 S/0020/64/159/002/0300/0302

AUTHOR: Vereshchagin, L. F. (Corresponding member AN SSSR); Starodubtsev, S. V. (Academician AN UzSSR); Yunusov, M. S.

TITLE: Coloring and luminescence of γ-ray-irradiated synthetic rubies

SOURCE: AN SSSR. Doklady*, v. 159, no. 2, 1964, 300-302

TOPIC TAGS: synthetic ruby crystal, ruby, gamma ray absorption spectrum, gamma ray irradiation, pleochroism, color saturation, thermoluminescence, paramagnetic resonance, absorption center, EPR

ABSTRACT: Crystals of light-rose synthetic ruby containing about 0.2-- 0.4% Cr_2O_3 were irradiated with γ-rays at a dose rate of 350 r/sec and a source temperature of 34°. The absorption spectrum of ordinary and extraordinary rays was measured by a system which included a UM-2 monochromator, a light polarizer, and an FEU-22 photomultiplier. It was found that at a dose of 10^3 r the absorption spectrum had already undergone a noticeable change. With an increase in dose, ruby density increases within the green and violet regions of the spectrum. At 10^3 r the greatest density change is in the red

Card 1/3

L 17686-65

ACCESSION NR: AP4049480

region, which remains virtually unchanged at higher doses. Pleochroism appears in the 420—530-mμ region and increases with each increase in dose. At doses on the order of 10^6 r, there occurs a noticeable color saturation. With irradiation, the spectrum shifts toward the shortwave region. Investigations of thermoluminescence due to irradiation of specimens annealed at a temperature rate of 4±0.3°/min, showed that within the temperature range of 20—500°, a wide luminescence maximum occurs at 300°. The specimens thus annealed almost completely lose the color acquired through radiation. Heating of an irradiated specimen to 250° followed by slow cooling has no effect on the absorption spectrum, but its illumination with ultraviolet rays from a mercury vapor lamp results 1) in a more intense luminiscence than that of nonirradiated specimens, 2) in the fading of absorption radiation bands, and 3) in the loss of thermoluminiscence. An EPR-2 system, was used for qualitative studies of the paramagnetic resonance spectrum in irradiated specimens. A parallel spectrum was investigated at a frequency of 9368 Mc. It was found that at doses of several thousand r, the number of absorption centers noticeably increases, and that at the points of maximum slope the lines become wider. It was also found that the line due to tran-

Card 2/3

L 17686-65

ACCESSION NR: AP4049480

2

sition 1/2 ↔ - 1/2 is more sensitive to irradiation than the line due to transitions - 1/2 ↔ 1/2. Orig. art. has: 2 figures.

ASSOCIATIONS: Institut fiziki vy*sokikh davleniy Akademii nauk SSSR (Institute of Physics of High Pressures, Academy of Sciences SSSR); Institut yadernoy fiziki Akademii nauk UzSSR (Institute of Nuclear Physics, Academy of Sciences UzSSR)

SUBMITTED: 06Nov63 ENCL: 00 SUB CODE: SS

NO REF SOV: 002 OTHER: 005 ATD PRESS: 3151

Card 3/3

L 52575-65 EWT(m)/EWP(i)/EWP(t)/EWP(b) JD

ACCESSION NR: AP5012025 UR/0377/65/000/001/0022/0023 13 12 B

AUTHOR: Starodubtsev, S.V.; Umarov, G. Ya.; Kordub, N.V.

TITLE: Solar film vacuum concentrator 2.7 m in diameter

SOURCE: Geliotekhnika, no. 1, 1965, 22-23

TOPIC TAGS: solar energy converter, solar film concentrator, vacuum concentrator

ABSTRACT: The solar concentrator designed and constructed at the Fiziko-tekhnicheskiy institut AN UzSSR (Physics and Engineering Institute, AN UzSSR) consists of a film mirror and a vacuum chamber in the shape of a frustum with fritted walls and base which insure a zenithal and azimuthal solar orientation. The tracking system provides for a rotation accurate to 0.5-1 degree. The instrument rests on a support of reinforced concrete which has withstood all the wind loads in 1963. The film, hermetically sealed on the open base of the conical vacuum chamber and acted upon by the difference in pressure forces, hugs the surface of the mirror and has sufficient reflecting power to concentrate the flux of radiant energy. By varying the vacuum in the tank, one can obtain mirrors which concentrate the radiant energy and have the desired focal distance. Orig. art. has: 1 figure.

Card 1/2

L 52575-65

ACCESSION NR: AP5012025

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physics and Engineering Institute, AN UzSSR)

SUBMITTED: 10Nov64 ENCL: 00 SUB CODE: EE

NO REF SOV: 000 OTHER: 000

Card 2/2

L 52574-65 EWT(m)/EPF(c)/EWP(i)/EPR/EWP(j)/T/EWP(t)/EWP(b) Pc-4/Pr-4/Ps-4
JD/WW/RM

ACCESSION NR: AP5012027 UR/0377/65/000/001/0028/0030 35

AUTHOR: Starodubtsev, S.V.; Arifov, U.A.; Umarov, G. Ya.; Kordub, N.V.; Akhmedov, S. 34 B

TITLE: Concentrator with an asbestos-cement base 15

SOURCE: Geliotekhnika, no. 1, 1965, 28-30 18

TOPIC TAGS: solar energy converter, film concentrator, concentrator base design, asbestos cement, polyethylene terephthalate film, binding resin, integral reflection coefficient

ABSTRACT: The authors used a mirror surface of metallized polyethylene terephthalate on an asbestos-cement base (15% asbestos, 85% cement). The concentrator was 92 cm in diameter, had a focal distance of 47 cm, and weighted 45 kg. The integral reflection coefficient was measured calorimetrically by placing a brass calorimeter at the focus of the mirror reflecting radiant energy. The energy balance of the concentrator was determined as the ratio of the flux striking a detector of radiant energy to the flux of radiant energy reflected from the mirror. It was found that the optical characteristics of the concentrator were equivalent to those of concentrators made of cast glass. The average value of the integral reflection coefficient was 0.78. This low value (compared

Card 1/2

L 52574-65

ACCESSION NR: AP5012027

to 0.86 determined earlier) is explained by the scattering of radiant energy due to small deformations (craters) in the surface of the film caused by the presence of holes made to allow gases to escape during the polymerization of the resin binding the polyethylene terephthalate to the asbestos-cement base. The results show that the cost of preparation of the concentrator and its weight can be reduced (as compared to spherical mirrors), and that it can be built in large sizes and various configurations. Orig. art. has: 1 figure, 1 formula and 1 table.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UzSSR (Physics and Engineering Institute, AN UzSSR)

SUBMITTED: 25Oct64 ENCL: 00 SUB CODE: EE, MT

NO REF SOV: 005 OTHER: 001

Card 2/2

L 45793-65 EWT(1)/EEC(t)/EWA(m)-2

ACCESSION NR: AP5009149 S/0166/65/000/001/0057/0059

20
19
B

AUTHOR: Starodubtsev, S. V.; Muminov, V. A.

TITLE: Ionic source with longitudinal magnetic field

21

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1965, 57-59

TOPIC TAGS: ion source, hydrogen discharge, ionization, impact ionization, oscillating discharge

ABSTRACT: The source described is based on the fact that a larger density of fast-electron current can be produced in an oscillating discharge produced in a longitudinal magnetic field, which causes the electrons to travel along helical trajectories and thereby increases the average distance traveled between electrodes and with it the ionization probability. The source developed was intended for the production of hydrogen ions, and is illustrated in Fig. 1 of the Enclosure. This discharge current reached 0.5 A and the field 750 Oe. The voltage was adjustable between 0 and 1000 V. The working pressure was 2 x 10^{-4} mm Hg. Discharge could

Card 1/3

L 45793-65
ACCESSION NR: AP5009149

be produced when the field reached 180 Oe, and saturation set in above 500 Oe. The drawing voltage could be adjusted from 2 to 1000 kV. The maximum ionic current reached 17 mA. Orig. art. has: 3 figures.

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 24Feb64 ENCL: 01 SUB CODE: EM, GC

NR REF SOV: 002 OTHER 002

Card 2/3

L 42136-65 EWP(e)/EWT(m)/EPF(c)/EWP(i)/EPF(n)-2 Pr-4/Pu-4 GG/WH
S/0166/65/000/001/0111/0112
ACCESSION NR: AP5009153

AUTHOR: Starodubtsev, S. V.; Yunusov, M.

TITLE: Effect of Gamma irradiation on the fluorescence yield of ruby

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 1, 1965, 111-112

TOPIC TAGS: ruby, Gamma irradiation, fluorescence yield, radiation damage, luminescence quenching

ABSTRACT: This is a continuation of an earlier study (Izv. AN UzSSR, seriya fiz.-mat. nauk, 1964, no. 1, 1962), in which an approximate visual estimate was made of the fluorescence of irradiated ruby. The present article reports the results of an electronically measured relative change in the fluorescence of γ-irradiated light-pink ruby containing ~0.09% chromium. The test set-up is shown in Fig. 1 of the Enclosure. The measurements consisted in comparing the luminescence intensity before irradiation and after irradiation at a fixed dose. The results show that the intensity of luminescence of ruby decreases after irradiation, and a dose of

Card 1/3

L 42136-65
ACCESSION NR: AP5009153

several thousand Roentgen results in an appreciable reduction of intensity. The shape of the intensity vs. wavelength curve remains practically unchanged at all doses. It is therefore concluded that the color centers produced upon γ-irradiation of the ruby do not contribute to its luminescence, and possibly contribute to its quenching. The appearance of such centers is attributed to contaminations which produce local defects in the ruby crystal, in addition to the defects produced by the γ-rays themselves. Orig. art. has: 2 figures. [02]

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 10Nov64 ENCL: 01 SUB CODE: SS, OP

NR REF SOV: 002 OTHER: 001 ATD PRESS: 3237

Card 2/3

L 2524-66 EWT(1)/EWT(m)/EPA(sp)-2/EPF(c)/EPA(w)-2/EWP(t)/EWP(b) IJP(c) JD/AT
ACCESSION NR: AP5020859 UR/0166/65/000/004/0079/0080

AUTHOR: Starodubtsev, S. V.; Muminov, V. A.; Babal'yants, V. F.; Abdurakhmanov, A. Kh.

TITLE: Ion source of hydrogen ions at low gas pressures

SOURCE: AN UzSSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, no. 4, 1965, 79-80

TOPIC TAGS: hydrogen ion, ion source, low pressure

ABSTRACT: The article describes a source in which the generated ions are drawn out in a direction perpendicular to the source, as shown in Fig. 1 of the Enclosure. The frame of the source consists of two 590-mm steel rings connected by eight stainless steel tubes 14 mm in diameter and 1900 mm long. The anode and cathode are in the form of 0.5-mm tungsten wires suspended from insulated sleeves on the framing tubes. The wires are alternately incandescent and cold, and the potential difference applied to them ignites the discharge. The source assembly is placed in a vacuum chamber of approximately 600-ℓ capacity evacuated with an oil-diffusion pump to 10^{-5} mm Hg. Hydrogen gas is fed in at a working pressure of (2—4) x 10^{-4} mm Hg. The discharge current ranged from 0.6 to 1 amp at an electrode potential on the order of 1.5 kv and a filament current of 32 amp, depending on the high negative

Card 1/3

L 2524-66
ACCESSION NR: AP5020859 3

potential applied to the collector. The latter was located 200 mm from the ion-production region. It is assumed on the basis of published data that at an arc current of 1 amp the percentage of H_1^+ ions reaches 90. The ion current varies linearly with the drawing voltage on the collector. Orig. art. has: 2 figures. [02]

ASSOCIATION: Institut yadernoy fiziki AN UzSSR (Institute of Nuclear Physics, AN UzSSR)

SUBMITTED: 15Sep65 ENCL: 01 SUB CODE: NP

NO REF SOV: 001 OTHER: 004 ATD PRESS: 4110

Card 2/3

L 2524-66
ACCESSION NR: AP5020859

ENCLOSURE: 01

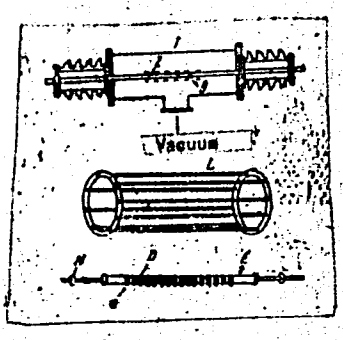


Fig. 1. Ion source

T - Vacuum chamber; L - frame;
Z - electrode; E - quartz tube;
D - yoke; N - porcelain bead;
B - grid.

Card 3/3

L 10265-66 EWT(1) IJP(c) GG
ACC NR: AP5027389 SOURCE CODE: UR/0181/65/007/011/3175/3179

44,55 44,55
AUTHOR: Starodubtsev, S. V.; Peshikov, Ye. V.

57
B

44,55
ORG: Institute of Nuclear Physics, AN SSSR, Moscow (Institut yadernoy fiziki AN SSSR)

TITLE: Radiation changes of properties of ferroelectrics due to an internal displacement field

SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3175-3179

21,44,55
TOPIC TAGS: ferroelectric, radiation damage, Rochelle salt, triglycene sulfate, gamma irradiation, dielectric constant, x ray irradiation, ferroelectric material, electric property

21,44,55
ABSTRACT: The properties of triglycene sulfate and Rochelle salt irradiated with gamma rays from a Co^{60} source at a dose rate of 0.4—0.6 Mr/sec were investigated. The comparison of the plot of the dielectric constant near the upper peak value of the Curie point E_{max} versus the external biasing field with that of E_{max} as a function of the internal space charge field showed that the effect of the biasing and space charge fields are equivalent and can be considered to be secondary effects arising as a result of irradiation. An attempt was made to explain an increase in E_{max} of Rochelle salt at small doses of x-ray and gamma irradiation. The effect of the space charge field during pulsed polarization of irradiated triglycene sulfate was also investigated. Orig. art. has: 6 figures and 2 formulas. [CS]

SUB CODE: 20/ SUBM DATE: 26Mar65/ ORIG REF: 007/ OTH REF: 006/ ATD PRESS: 4164

Card 1/1

[redacted], S.V., [redacted], V.A.

Ion source with a longitudinal magnetic field. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.1:57-59 '65. (MIRA 18:6)

1. Institut yadernoy fiziki AN UzSSR.

STARODUBTSEV, S.V.; YUNUSOV, M.

Effect of gamma rays on ruby fluorescence yield. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.1:111-113 '65. (MIRA 18:6)

1. Institut yadernoy fiziki AN UzSSR.

BIARDI[illegible], [illegible]; [illegible]OV, [illegible]; CHERNOV, I.G.

[illegible]e focusing in mass spectrometers using a nonuniform magnetic field. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.4:40-44 '65. (MIRA 18:9)

1. Institut yadernoy fiziki AN UzSSR.

STARODUBTSEV, S.V.; MUMINOV, V.A.; BABAL'YANTS, V.F.; ABDURAKHMANOV, A.Kh.

Hydrogen ion source at low gas pressure. Izv. AN Uz. SSR. Ser. fiz.-mat. nauk 9 no.4:79-80 '65. (MIRA 18:9)

1. Institut yadernoy fiziki AN UzSSR.